



Metrology Services

UKAS Calibration, Verification, Sub-Contract Inspection, Programming and Support



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Torus Metrology

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Telford, TF3 3AJ
United Kingdom

+44 (0) 1952 210020

+44 (0) 1952 299804

tms.inspection@torus-group.com



Cert no. FM 570505



0773
Calibration Laboratory

Why choose Torus Metrology?

By choosing Torus Metrology, you are choosing a UKAS accredited calibration laboratory. Not only can you rest assured that you are receiving the most appropriate service for your requirements, but you will also discover that the UKAS 'symbol' on your documentation brings with it national and international recognition to your business. You should be confident that your goods, services, and their component parts are based on measurements taken with correctly calibrated measuring equipment. There is a way to ensure that your organisation adheres to the requirements of its ISO 9001 certification, which also means you can have increased confidence that any calibration carried out on your behalf is done so in a reliably competent, consistent, and impartial manner and to the correct degree of accuracy.

The international standard ISO/IEC 17025 defines what is required of a laboratory in order for it to demonstrate both technical competence of the personnel and the availability of all the technical resources needed to produce reliable data and results for a defined set of tests, measurements or calibrations.

Choosing a competent calibration laboratory is important in maintaining your reputation as a responsible business. It is therefore paramount that you choose to use the service of a laboratory whose competence has been confirmed by an independent, authoritative third party such as UKAS.

Torus Measurement Systems are UKAS accredited and rigorously audited to BS EN ISO/IEC 17025 procedures, ensuring you receive the **best possible service**.

Connect with us...



www.torus-group.com

UKAS

CMM

ARM

HEIGHT GAUGE

SUB-CONTRACT



UKAS



Torus Metrology provide UKAS Calibration Services for Dimensional Measurement.

Offering both 1st Principle and CMM capabilities, our expertise and knowledge provide a complete UKAS Calibration Service for the dimensional measurement of components, including but not limited to; machined parts, castings, injection mouldings, tooling, receiver and positions gauges, jigs, fixtures and final products.

Master and Artefact Calibration

Torus also provide a comprehensive UKAS calibration and recall service for all Masters and Artefacts.



As an original equipment manufacturer (OEM), this also includes Masters and Artefacts supplied with our Metal Packaging, Plastic Packaging, Aerospace, Medical and General Gauging.

We recommend an annual re-calibration in which your Masters and Artefacts will be assessed for wear, damage and integrity to ensure your final product quality is never compromised.

Technical Specification

Accreditations

- > ISO/IEC 17025:2017 (UKAS approved measurement methods)
- > ISO 9001:2015 (BSI approved Quality Management System)
- > UKAS Certificate of Accreditation, Calibration Laboratory No. 0773
- > UKAS Schedule of Accreditation - click [here](#)

Measurement Capacity:

- > 900 x 1500 800 mm

Benefits to your business

- > Accredited and professional calibration service
- > Traceable to UK and International Standards
- > Continual commitment to quality
- > Quick turnaround and value for money
- > UKAS certification
- > We manage it for you - **Torus Recall Management System** will contact you six weeks prior to your calibration due date

For a full list of our UKAS calibration and measurement capabilities please [click here](#) and to discuss your UKAS Calibration needs, please get in touch with our metrology team on **01952 210 020** or email tms.inspection@torus-group.com

Remember...

For ease...

Items requiring calibration can be pre-booked to minimise any inconvenience, ensuring that we meet specific customers needs



CMM



UKAS CMM Verification and Service



Torus Metrology provide a UKAS CMM Verification and Service across a wide range of industries.

Torus recommend an annual UKAS verification and service of all CMM equipment, due to dust and airborne contaminants settling on CMM scales, belts, drives, pipe-lines and guideways. This ensures minimal impact on production and manufacturing, whilst providing verification that the CMM continues to satisfy your measurement requirements.

Your UKAS verification and service will include:

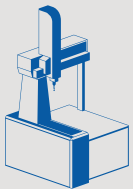
- A standard **service** ensuring your CMM is in good working order, which will include a detailed review of your CMM capabilities and environmental conditions.
- A comprehensive CMM verification, conducted in accordance with the technical specification detailed, will be completed by one of Torus' **UKAS accredited** engineers.
- Once completed you will be provided with a detailed **verification report** and a **UKAS Calibration Certificate**.
- You will be added to Torus' **Recall Management System** and will be contacted 6 weeks prior to your CMM verification due date.

Technical Specification

UKAS Calibration Certificate provided in accordance with:

- › **BS EN ISO 10360-2, BS EN ISO 10360-5, BS EN ISO 14253-1**
 - › **Verified against customer and OEM specification**
 - › **Verified at 7 measurement positions including angles**
 - › **Using 1020 mm NPL UKAS calibrated Koba gauge and UKAS calibrated 25 mm sphere**
 - › **Reporting Stylus form error, MPE, Stylus size error, Repeatability, Error of length, Error of length**

CMM Manufacturers



Torus provide verification services for many manufacturers of CMM:

- › **DEA**
- › **Mitutoyo**
- › **LK**
- › **Wenzel**
- › **Hexagon**
- › **Brown & Sharpe**
- › **QCT**
- › **Aberlink**
- › **Zeiss**

Remember...

We recommend a **Health Check** as an interim visit between verification periods, so for customers with an annual verification, a health check 6 months after verification is the recommended time scale



Benefits to your business

- › UKAS Calibration Certificate for all CMM verifications
- › Confidence in CMM accuracy and performance
- › Multiple volume verification option for larger CMM
- › Each machine verification completed within 1 working day to reduce downtime (Max volumes 3/CMM)
- › Error mapping service available if required.
- › We manage it for you - **Torus Recall Management System** will contact you six weeks prior to your CMM verification due date.
- › Torus are not linked to any OEM's meaning we can deliver a completely impartial service

To book in your UKAS CMM Verification and Service, please get in touch with our metrology team on

01952 210 020 or email

tms.inspection@torus-group.com



Click [here](#) to view the video

CMM Services

CMM

Torus have the capability, along with our technical partners, to support most types of CMM.



Response

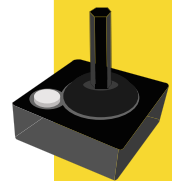
Torus along with our technical partners have historically been on site within 48 hours. Most cases this results in a repair on the first visit - as we assess the job before attending and try to bring as many spares as possible.



Legacy Controllers

Torus and our partners have a robust collection of spares for legacy controllers - including replacements for many types of CMM. We also have many modern replacement parts for obsolete boards and power supplies.

We are also working on a complete controller replacement, that doesn't require updating the software via OEM - which is often 50% of the cost of a retrofit.



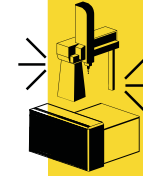
Jog Boxes

Jog boxes are often the main point of failure - they are the most handled item and can be dropped. Torus and our partners hold refurbished jog boxes for many brands of CMM and offer either a loan unit whilst yours is being repaired or a repair by exchanging - sending your old unit in and receiving a professionally refurbished unit in exchange.



Granite Repairs

Torus have access to granite repair services. This includes chips, holes and general wear in the bearing surfaces. Any physical alterations are then removed by adjusting the error map.



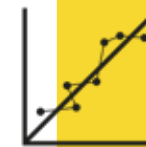
Overhaul

Torus have carried out refurbishment of obsolete drive systems, and/or replacements. Torus have inhouse design and manufacturing facilities, to repair or replace items which are no longer available. Obsolete reader heads are replaced with current Renishaw solutions, by designing custom brackets and interfacing electronics where required.



Torus CMM Moves

Torus have the capability to de-commission, move and re-commission most manufacturers and types of CMM. Working with our CMM heavy lift company, Torus can relocate a CMM anywhere in the UK and abroad.



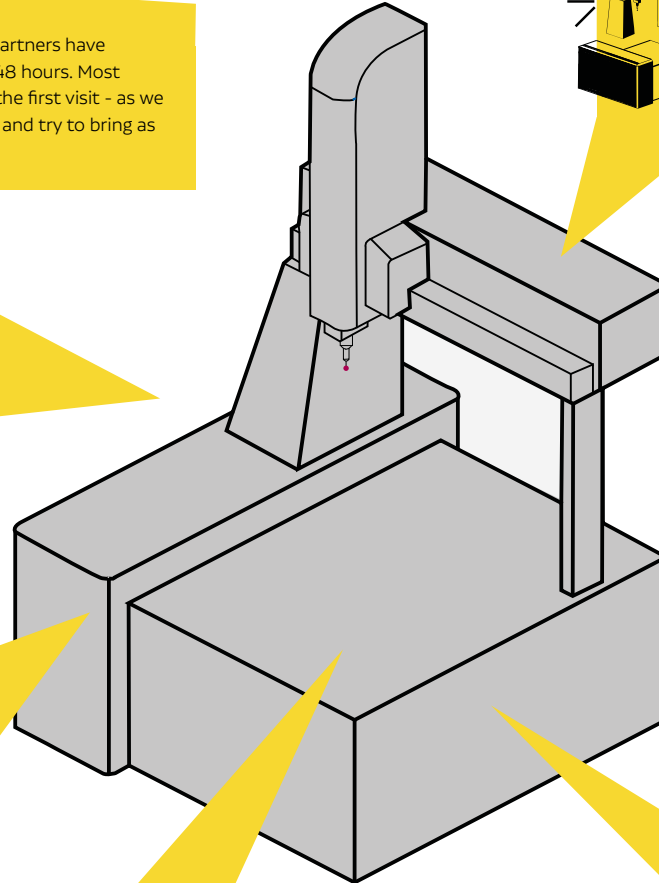
Error Mapping

After the re-commission process an assessment of results determines whether a verification or calibration is required. If adjustments to the error map are required then Torus use Xpert Mapping™ to achieve OEM specification.



Shipping/Transportation Brackets

If the OEM shipping brackets are unavailable, Torus can supply custom made bracketry to guarantee safe transportation of your CMMs.



CMM Spares and Accessories

Torus Metrology provide independent onsite consultation to determine the best solution for your application.

Torus stock a wide variety of spares and aim to deliver within 48 hours. Torus are also able to source components from multiple OEM's and can be your 'one-stop' shop saving you time and effort.

Torus also supply our own range of metrology tables and enclosure, all designed and built in-house to your requirements.

MODULES

- » TP20 6 Way
- » TP20 EF
- » TP20 LF
- » TP20 MF
- » TP20 SF



METROLOGY TABLES

Designed and built to your specification.



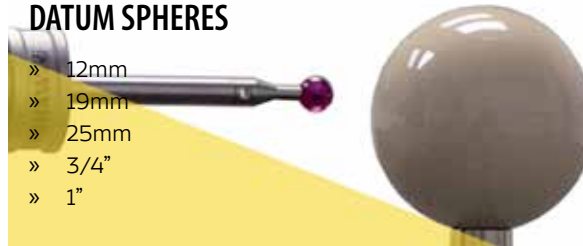
BODIES

- » TP2 exchanges
- » TP20
- » TP200



DATUM SPHERES

- » 12mm
- » 19mm
- » 25mm
- » 3/4"
- » 1"



ENCLOSURES

Designed and built to your specification.



PROBEHEADS

- » From PH10 T upwards
- » Manual and CNC
- » 3 axis and 5 axis



TIPS/STYLI

A variety of tip lengths, ruby diameters and extensions are available



SCANNING PROBES

We supply the full range of scanning setups from SP25 upwards



RACKS

Full range of Probe Changer Racks available



Remember...

Can't see what you are looking for?

Other than those listed here, Torus offer a wide range of accessories and spares to suit your specific needs.

Get in touch with our Metrology department to discuss your options



01952 210 020

tms.inspection@torus-group.com

CMM Training

CMM



Choosing Torus Technology Group as your CMM training provider means you are benefiting from a training team with years of CMM experience.

Our team of experts have developed a training program that is structured to not only meet all of the essential CMM training requirements, but to also allow users to tailor the course to their own needs and focus on the areas of training that are most beneficial to you and your business.

Based on your requirements, CMM training courses can be delivered one-to-one or in small group classes and can be conducted on-site, or in our own state-of-the-art UKAS laboratory.

Training Breakdown

Basic Training; Typical Agenda

- CMM Introduction
- Probe Setup and Qualification
- Measuring Features manually
- Alignments
- Automatic Features measurement
- Constructing Features
- Editing a Measurement Routine
- Dimensioning and Reporting
- Introduction to CAD

Advanced Training; Typical Agenda

- Review of Probe Calibration and Part Alignment
- Automatic Feature measurement (higher level)
- Introduction to Scanning
- Use and Applications of Loops
- Complex Alignments
- Use of Variables
- Introduction to Logic and Branching
- Advanced Reporting Techniques

GD&T Application Training; Typical Agenda

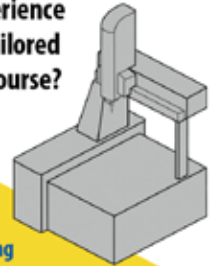
- Introduction to GD&T
- Applying GD&T within PC-DMIS
- Understanding and Optimising the Report

Remember...

Already got experience and want a more tailored training course?

Contact us and we can create a bespoke training course to suit your needs.

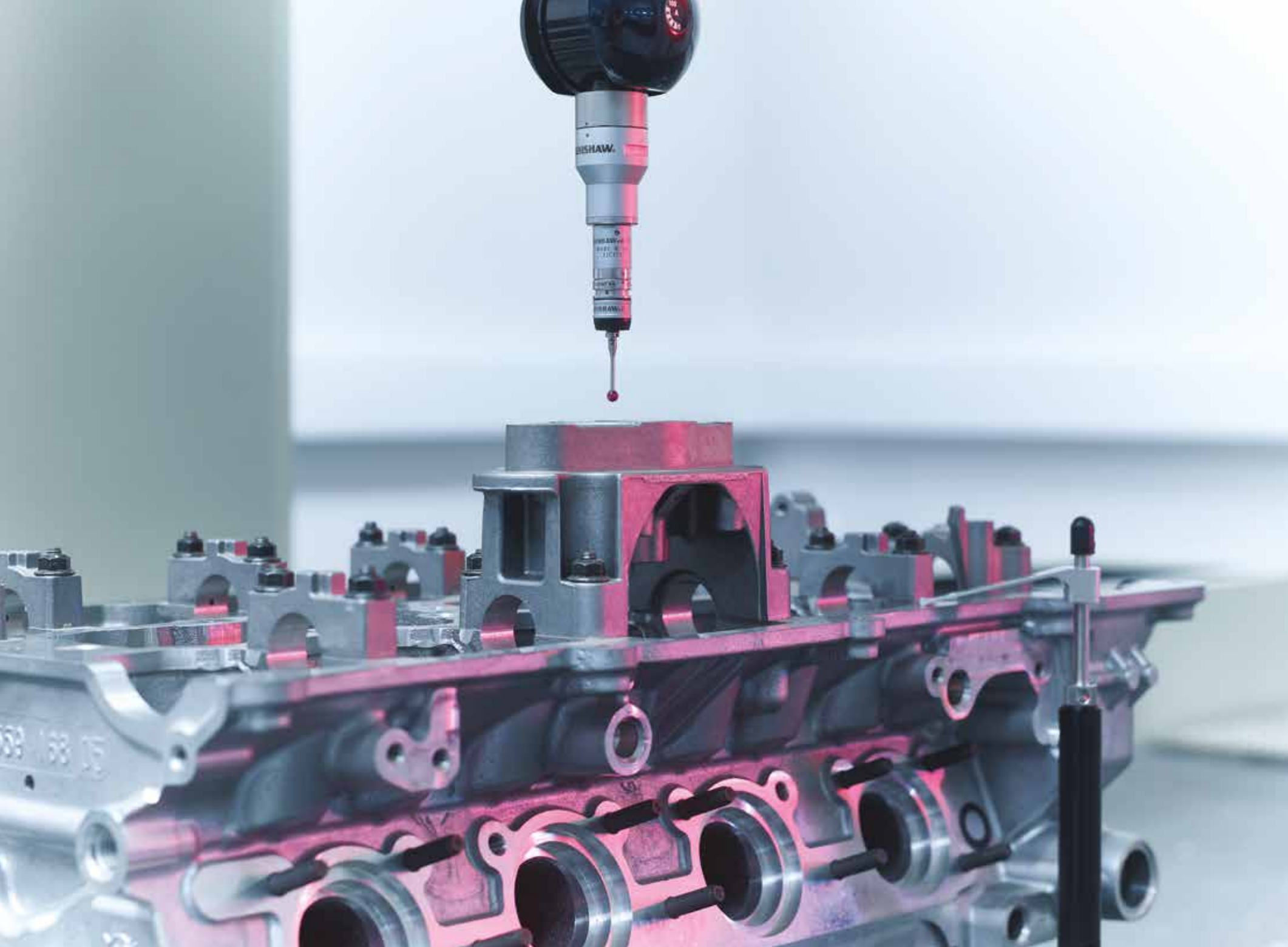
Torus can support your development needs from expanding existing knowledge, to advising on best practise.



If you have an individual training requirement or would like to make a group booking, contact our Telford site on 01952 797 855, or complete our [online contact form](#) and a member of our CMM Training Team will contact you to discuss your requirements.

Key Benefits

- > A range of Hexagon and Mitutoyo machines equipped with either touch trigger probing or analogue scanning
- > Large range of CMM and Arm software including PC-DMIS and associated options
- > Each course quoted prior to delivery to ensure all requirements are captured



Arm



Torus Metrology provide a full UKAS Arm Verification service covering a wide range of industries.

Torus recommend an annual UKAS verification of all measurement Arms, ensuring confidence in the Arm performance within the working environment, to ensure a minimal impact on production and manufacturing, whilst providing verification that the Arm continues to satisfy your measurement requirements.

Your UKAS Arm Verification consists of:

- A basic **health check** on your Arm to ensure good working order prior to starting the verification.
- All of our engineers are **accredited by UKAS** and will conduct your Arm verification in accordance with the technical specification detailed.
- Once completed you will be provided with a detailed **verification report** and **UKAS Calibration Certificate**.
- You will be added to Torus' **Recall Management System** and will be contacted 6 weeks prior to your Arm verification due date.

Technical Specification


UKAS Calibration Certificate provided in accordance with:

- > **BS EN ISO 10360-12**
 - > **Verified against customer or OEM specification**
 - > **Verified at 7 measurement positions including angles**
 - > **Using 1020 mm NPL UKAS calibrated Koba gauge and UKAS calibrated 25 mm sphere**
 - > **Reporting Stylus form error, Stylus size error, Repeatability, Error of length, Articulation error**

Benefits to your business

- > UKAS Calibration Certificate for all Arm verifications.
- > Confidence in Arm accuracy and performance.
- > Each on-site Arm verification completed within 1 working day (UK & Ireland).
- > Each off site Arm verification turnaround within 48 hours.
- > Advanced reporting: Flip Error reporting as standard.
- > We manage it for you - **Torus Recall Management System** will contact you six weeks prior to your Arm verification due date.
- > Torus are not linked to any OEM's meaning we can deliver a completely impartial service.

To book in your UKAS Arm Verification, please get in touch with our metrology team on **01952 210 020** or email tms.inspection@torus-group.com

 Click [here](#) to view the video

Arm Manufacturers



Torus provide verification services for many manufacturers of Arms:

- > **Faro**
- > **Kreon**
- > **Hexagon/ Romer**
- > **Nikon**

Remember...

For ease...

You are able to send your portable Arms via courier to our UKAS temperature controlled lab for verification

We always strive for a **48 hour turnaround**

Arm Verification Service



Height Gauge



UKAS Height Gauge Verification



Torus Metrology provide a full UKAS Height Gauge Verification across a wide range of industries.

Torus recommend an annual UKAS verification of all complex height gauges ensuring confidence in the gauge performance within the working environment. This ensures minimal impact on production and manufacturing whilst providing verification that the height gauge continues to satisfy your measurement requirements.

Your UKAS Height Gauge Verification will include:

- A **bi-directional verification** over the full range of your height gauge, performed by one of our **UKAS accredited** engineers.
- Once completed you will be provided with a detailed **verification report** and a **UKAS Calibration Certificate**.
- You will be added to Torus' **Recall Management System** and will be contacted 6 weeks prior to your Height Gauge verification due date.

Remember...

To complement your Height Gauge Verification, Torus can also arrange recalibration of your surface table.



Height Gauge Manufacturers



Torus provide verification services for many manufacturers of complex Height Gauges:

- > **TESA**
- > **Mitutoyo**
- > **Digimar**
- > **Eley**
- > **Brown & Sharpe**

Technical Specification

UKAS Calibration Certificate provided in accordance with:

- > **BS EN ISO 13225, BS EN ISO 14978, BS EN ISO 14253-1**
 - > **Verified against customer or OEM specification**
 - > **Using NPL calibrated 1020 mm Koba Step Bar**

Benefits to your business

- > UKAS Calibration Certificate for all Height Gauge verifications.
- > Confidence in Complex Height Gauge accuracy and performance
- > We can carry out multiple Height Gauge verifications within 1 working day (max 3)
- > Our engineers can also carry out UKAS CMM and Arm verifications during the same visit
- > We manage it for you - **Torus Recall Management System** will contact you six weeks prior to your Height Gauge Verification due date.
- > Torus are not linked to any OEM's meaning we can deliver a completely impartial service.

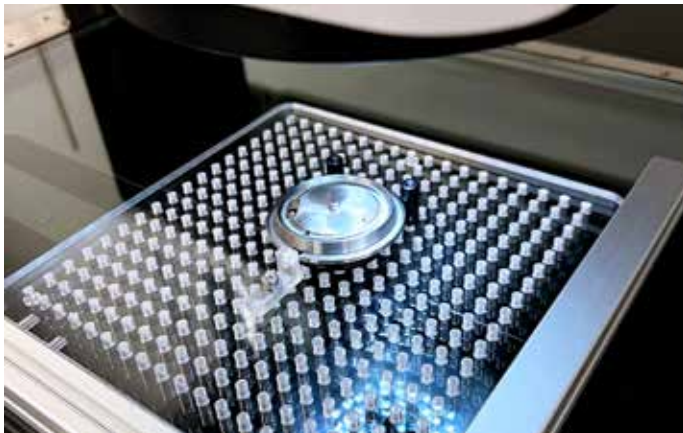
To book in your UKAS Height Gauge Verification, please get in touch with our metrology team on

01952 210 020 or email

tms.inspection@torus-group.com



Sub-Contract



Torus Metrology provide a wide range of Sub-Contract Inspection services to meet your inspection requirements.

Torus' inspection team work closely with our customers to meet their measurement requirements; our expertise and knowledge can help provide you with a quick, easy and professional reporting. Our experience across a wide range of industries including **medical, automotive, aerospace, presswork, injection molding, packaging** and more, allows us to tailor part measurement and inspection services to suit each customer's inspection needs; from single first articles to large-scale volume batches.

Within Torus' UKAS accredited laboratory we have the capability to offer **First Principle Inspection, Optical CMM Inspection** and **Tactile CMM Inspection**, which can be utilised for:

- First Article Inspection Reports (**FAIR**)
- First-Off Inspection Reports (**FOIR**)
- Last Article Inspection Reports (**LAIR**)
- Initial Sample Inspection Reports (**ISIR**)
- Production Part Approval Process (**PPAP**)
- And more!

Technical Specification

Optical Measurement Capacity:

- > 500 x 450 x 200 mm working volume
- > 2.4+5L μ m approximate accuracy

Tactile Measurement Capacity:

- > 900 x 1500 x 800 mm working volume
- > 3+3L μ m approximate accuracy

Benefits to your business

- > Increase your inspection technical capability by using Torus' laboratory.
- > Offsite capacity you can switch on or off as needed.
- > Independent 3rd party results that can be trusted.
- > Flexibility to solve problems and work with you directly to ensure your requirements are met.
- > Quick turnaround where required.
- > A wide range of equipment and methods, including First Principle Table Inspection, Height Gauging, Arm Inspection, Tactile CMM, Optical CMM, Laser Scanning and more.
- > UKAS certification available.
- > Uncertainty budgets available.
- > Customisable reporting.
- > Traceability to international standards.

To discuss your sub-contract inspection needs, please get in touch with our metrology team on

01952 210 020 or email

tms.inspection@torus-group.com

Remember...

We also offer...

Type 1 Capability Study
Type 2 R&R Study
PPK
CPK

and many other process evaluation testing

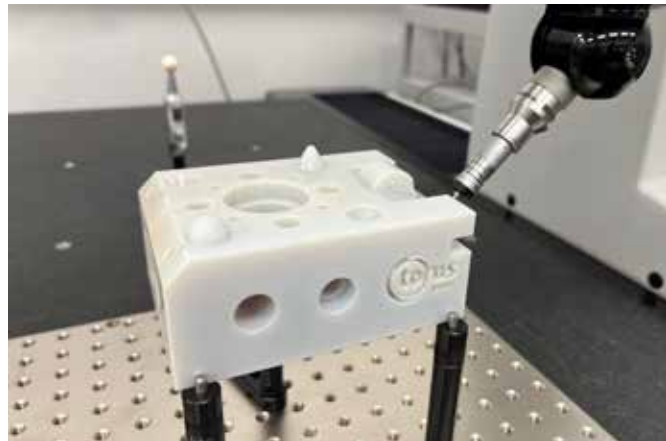


Sub-Contract Programming

```

I_SLIP_Y_FIH=FEAT/CONTACT/VECTOR_POINT/DEFAULT,CARTESIAN
TREQ/<-20*1,42*1,-10*1>,<ZERO,ONE,ZERO>
ACTL/<-20,901,42,1246,-10,9003>,<0,1,0>
TARG/<-20*1,42*1,-10*1>,<ZERO,ONE,ZERO>
SSAP=NO
SHOW FEATURE PARAMETERS=NO
SHOW CONTACT PARAMETERS=YES
AVOIDANCE MOVE=NO,DISTANCE=15
SHOW HITS=NO
I_SLIP_Y_THF=ALIGNMENT/START,RECALL:I_SLIP_Z_THF,LIST=YES
ALIGNMENT/TRANS,AXIS,I_SLIP_Y_FIH
ALIGNMENT/END
CLEARP/XTLUS,-78,XPLUN,-78,ON
MOVE/INCREMENT,<0,0,3>
MOVE/CLEARFLASK
I_SLIP_X_LIN=FEAT/LINE,CARTESIAN,CONCISE
TREQ/<-35*1,-4.5*1,-10*1>,<ONE,ZERO,ZERO>
ACTL/<-35,0668,-7,3003,-9,8973>,<0,-0.0000034,-1>
HEAD/LINE,2,WORKPLANE
HIT/BASIC,NORMAL,<-35*1,-4.5*1,-10*1>,<ONE,ZERO,ZERO>,<-35,9093,-4,9093,-9,7>
MOVE/CLEARFLASK
HIT/BASIC,NORMAL,<-35*1,-4.5*1,-(LARGE_SLIP-10)>,<ONE,ZERO,ZERO>,<-37,923,-9
ENDHEAD/
I_SLIP_X =ALIGNMENT/START,RECALL:I_SLIP_Y_THF,LIST=YES
ALIGNMENT/ROTATE,ZINUS,TO,I_SLIP_X_LIN,ABOUT,WVECS
ALIGNMENT/TRANS,AXIS,I_SLIP_X_LIN
ALIGNMENT/END

```



Torus Metrology provide part programming for a wide range of industries using our team's expertise and experience.

Torus' team of experienced engineers can help alleviate your programming load to create high quality, ready-to-go programs catered to your drawing requirements. Our experience across a wide range of industries means we can create programs for even the most demanding components, with or without CAD data.

Programs can be created offline or live on a sample component in our UKAS Accredited Laboratory, ensuring program prove out is completed without disruptions to your production/inspection schedule. Can't send a sample? Don't worry - Torus have in-house 3D printers available, simply send us the CAD file and we can prove out the programs using printed components.

Fixtures can be designed, manufactured and tested at Torus to provide full turnkey solutions installed by our engineers. Our in-house 3D printing capability means we can create bespoke fixturing systems that traditional manufacturing would struggle with. A smooth handover process means you only need to press go!

Sudden engineer unavailability? Torus can assist you with on-site programming. Our engineers will come to your site and work on your CMM to cover any lost production time.

Benefits to your business

- Reduce machine down time, programming is the longest part of the inspection process
- Reduce inspector workload and improve efficiency.
- 3D printing to prove out programs or create bespoke fixturing systems
- Cover specialist programming requirements
- Cover skill gaps within your business
- Work directly you to create program based on your requirements
- On-site programming support to cover unexpected engineer unavailability
- Results formatted in the way you require

To discuss your sub-contract programming needs, please get in touch with our metrology team on **01952 210 020** or email tms.inspection@torus-group.com

Click [here](#) to view the video

Remember...

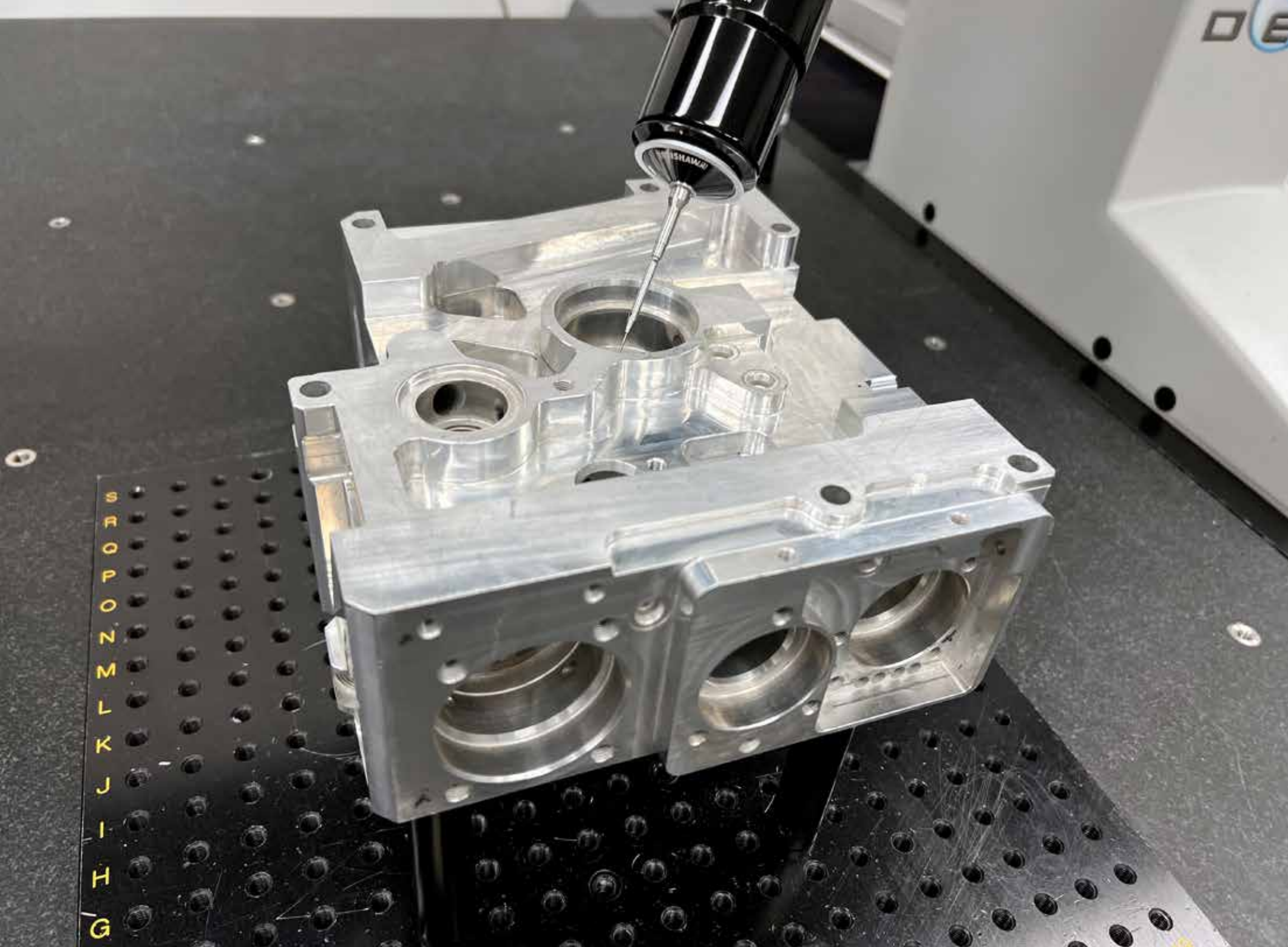
We offer...

- Offline/online prove out at Torus
- Full turnkey solutions
- On-site programming
- Programming with or without CAD
- 3D printing to test programs

Software Capabilities

- Hexagon PC-DMIS
- OGP MeasureMind 3D

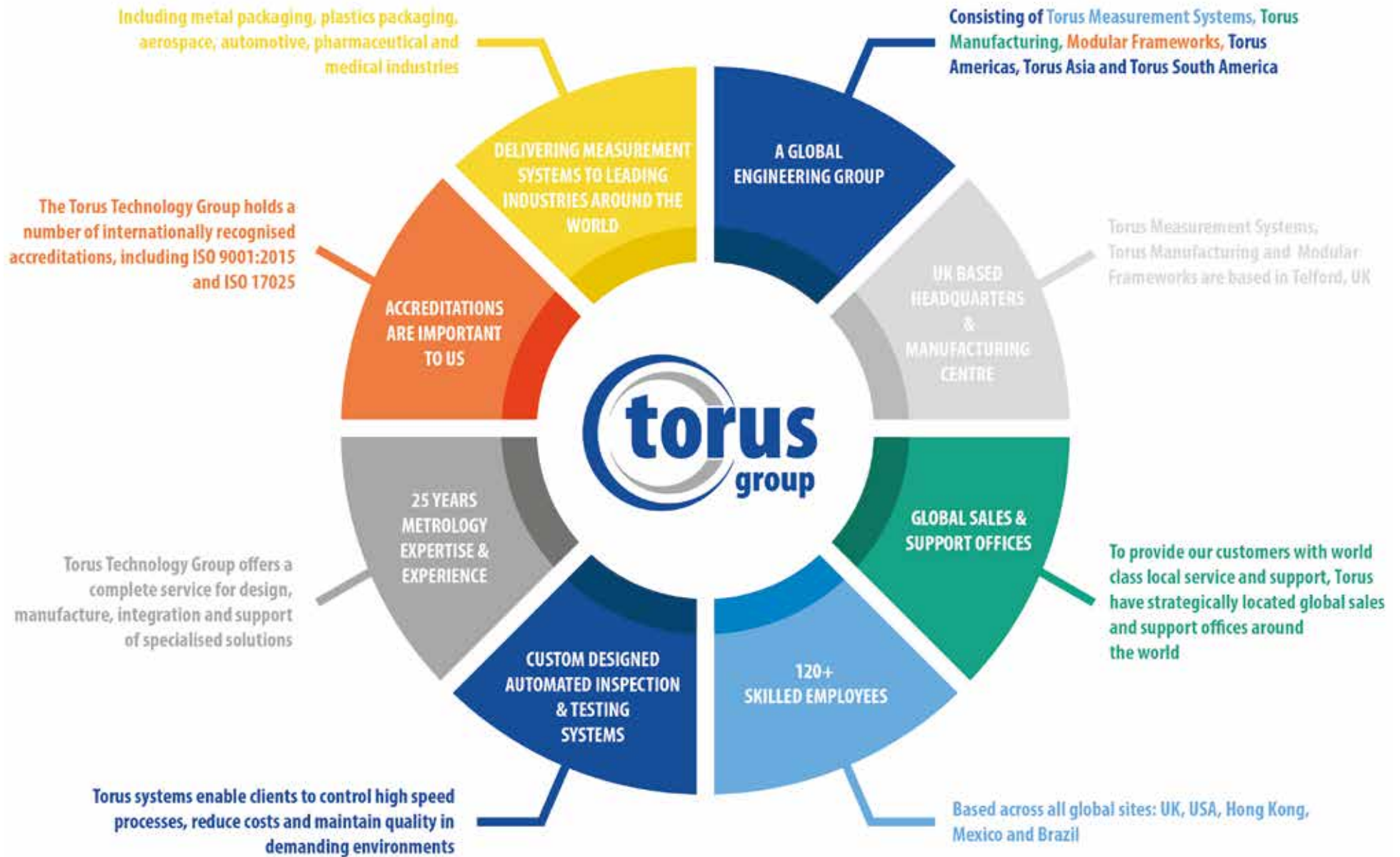
Challenge us, we're engineers at heart!



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Who are Torus Group?





Torus Technology Group are:



Whenever you need us, we can be there



Torus Americas, Inc.

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F: 001-303-279-7551

E: tai.sales@torus-group.com

Torus South America

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T (Brasil): 0055 11 3672 1082

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E: tsa.helpdesk@torus-group.com

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Customer Support Process





www.torus-group.com